

What is claimed is:

1. A method of manufacturing a semiconductor substrate provided with a through hole electrode by which first and second principal sides of said semiconductor substrate communicate with each other, said manufacturing method comprising:
  - (a) forming a first insulating layer on a first principal side of said semiconductor substrate;
  - (b) forming a small hole through said semiconductor substrate extending from the second principal side of said semiconductor substrate and to said first insulating layer;
  - (c) forming a second insulating layer on the inside surface of said small hole;
  - (d) forming a thin metal film on said first insulating layer;
  - (e) removing a portion of said first insulating layer between said thin metal film and said small hole in order to expose said thin metal film to said small hole; and
  - (f) filling a conductive material into said small hole in order to form a through hole electrode which is electrically connected to said thin metal film;
2. The manufacturing method of a semiconductor substrate as set forth in claim 1 wherein said thin metal film includes two layers made of different metals.
3. The manufacturing method of a semiconductor substrate as set forth in claim 1 wherein said small hole is formed by a Deep-Reactive Ion Etching technique.
4. The manufacturing method of a semiconductor substrate as set forth in claim 3 wherein said thin metal film includes two

layers made of different metals.

5. The manufacturing method of a semiconductor substrate as set forth in claim 1 wherein a device is formed in said first principal side of said semiconductor substrate and wherein said second insulating layer is further formed in the second principal side of said semiconductor substrate.

6. The manufacturing method of a semiconductor substrate as set forth in claim 5 wherein said thin metal film includes two layers made of different metals.

7. The manufacturing method of a semiconductor substrate as set forth in claim 5 wherein said small hole is formed by a Deep-Reactive Ion Etching technique.

8. The manufacturing method of a semiconductor substrate as set forth in claim 7 wherein said thin metal film includes two layers made of different metals.

9. The manufacturing method of claim 1, wherein the steps are carried out in the order of (a), (b), (c), (d), (e) and (f).

10. The manufacturing method of claim 5, wherein the steps are carried out in the order of (a), (d), (b), (c), (e) and (f).

11. The manufacturing method of claim 1, wherein an insulating layer is formed on the second principal side of the substrate at the step (a).

12. The manufacturing method of claim 1, wherein an insulating layer is

formed on the second principal side of the substrate at the step (c).